

IN THE CLAIMS

The claims are amended as reflected in the claims listing, in which deleted matter is shown by strike-through and added matter is shown by underlining.

CLAIMS LISTING**CLAIMS:**

1. (Currently amended) A scanning interferometer comprising:
 - i. a light source;
 - ii. a fiber optic assembly comprising:
 - a. polarization maintaining fiber having P and S modes;
 - b. splitting means for splitting the P and S modes ~~propagating in of~~ said fiber wherein said S mode propagates in one arm in one polarization axis and said P mode propagates in the other arm in the other polarization axis;
 - c. an optical path length modulator; and
 - d. a reference mirror.
2. (Original) An interferometer as claimed in claim 1 wherein said polarization maintaining fiber has fast and slow birefringent axes supporting fast and slow propagation modes.
3. (Original) An interferometer as claimed in claim 1 further comprising an analyzer.
4. (Original) An interferometer as claimed in claim 1 further comprising a detector.
5. (Original) An interferometer as claimed in claim 1 wherein said modulator is a piezo-electric actuator and a fiber stretching device.
6. (Original) An interferometer as claimed in claim 5 wherein said fiber stretching device has a low polarization mode dispersion.

7. (Original) An interferometer as claimed in claim 1 wherein said light source is a super luminescent diode.

8. (Original) An interferometer as claimed in claim 1 wherein said light source is an edge emitting light emitting diode.

9. (Original) An interferometer as claimed in claim 1 wherein said splitting means is a polarization splitter.

10. (Currently Amended) A scanning interferometer as claimed in claim 1 comprising:

i. a light source;

ii. a fiber optic assembly comprising:

a. polarization maintaining fiber having P and S modes;

b. splitting means for splitting the P and S modes of said fiber wherein

said S mode propagates in one arm in one polarization axis and said P

mode propagates in the other arm in the other polarization axis;

c. an optical path length modulator; and

d. a reference mirror

where said splitting means is a coupler having four polarization maintaining fiber ports one of which is orientated with birefringent axes orthogonal to the other three ports.

11. (Original) A scanning interferometer comprising:

i. a light source comprising a super luminescent diode or an edge emitting light emitting diode;

- ii. a fiber optic assembly comprising:
 - a. polarization maintaining fiber having fast and slow birefringent axes supporting fast and slow propagation modes;
 - b. a polarization splitter;
 - c. an optical path length modulator comprising a piezo-electric actuator and a fiber stretching device having a low polarization mode dispersion;
 - d. a reference mirror;
 - e. an analyzer; and
 - f. a detector.

12. (New) A scanning interferometer comprising:

- i. a light source;
- ii. a fiber optic assembly comprising:
 - a. polarization maintaining fiber having P and S modes;
 - b. splitting means for splitting the P and S modes of said fiber wherein said S mode propagates in one arm in one polarization axis and said P mode propagates in the other arm in the other polarization axis;
 - c. an optical path length modulator; and
 - d. a reference mirror

where said splitting means is a coupler having four polarization maintaining fiber ports, one or two of which is orientated with birefringent axes orthogonal to the other ports.